

**POSITIVE DISCONNECT DEVICE FOR NETWORKED COMPUTER  
(114356.00002)**

## FIELD OF THE INVENTION

This invention relates to networked computers, and more particularly, to a positive disconnect device for isolating a networked computer from the network.

## BACKGROUND OF THE INVENTION

Networked computers and computers with Ethernet connections are common today, and will be more common in the future. Computers which can communicate with other devices have numerous advantages. Information of all kinds and in many different formats can be sent to other computers and information of all kinds and in many different formats can be received from other computers. As this has been found to be of considerable value, increasingly connections with outside computers are maintained continuously, even if there is a prolonged period of inactivity by a user of the computer. This is done in the name of expediency, especially with personal computers (PCs) which are disheartening slow to reach a state where it can receive instructions after it has been turned on.

However, along with these advantages come certain potential disadvantages. Computer programs which deliberately damage the software of computers that they infest are known as viruses. Many viruses can be created in one place and then

1 transmitted over the Internet via receipt of an e-mail message or otherwise as an  
2 attachment to data sent to the computer from outside the computer. Anti-viral software  
3 can scan many existing files and incoming files and delete or block such viruses, but  
4 those who create viruses are continually looking for ways to defeat the various known  
5 security measures which have been developed. As long as the computer is in  
6 communication with the outside world, the potential for receiving a virus which would  
7 damage the computer's software exists. It would be desirable to provide a simple,  
8 straightforward way to protect computers from receiving viruses, especially during  
9 prolonged periods of inactivity by the user.

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11 SUMMARY OF THE INVENTION

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13 In accordance with a first aspect, a computer security system for a computer  
14 connected to a data generation device (such as a networked computer) is provided.  
15 The data generation device generates an input signal which is received by the computer  
16 when connected to the data generation device. The security system comprises a user  
17 interface which generates an output signal, a networking device which receives the  
18 input signal from the data generation device when connected with the data generation  
19 device, and a positive disconnect device which selectively prevents operative  
20 connection between the networking device and the data generation device when the  
21 output signal corresponds to a preselected period of inactivity of the user interface.

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1        From the foregoing disclosure and the following more detailed description of  
2 various preferred embodiments it will be apparent to those skilled in the art that the  
3 present invention provides a significant advance in the technology and art of computer  
4 security systems. Particularly significant in this regard is the potential the invention  
5 affords for providing a high quality, low cost security system with high reliability.  
6 Additional features and advantages of various preferred embodiments will be better  
7 understood in view of the detailed description provided below.

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9 BRIEF DESCRIPTION OF THE DRAWINGS

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11        Fig. 1 is a schematic of a networked computer with a positive disconnect device  
12 for the network in accordance with a first preferred embodiment where the positive  
13 disconnect device is a separate plug-in to a computer.

14        Fig. 2 is a schematic of a networked computer with a positive disconnect device  
15 in accordance with a second preferred embodiment where the positive disconnect  
16 device is part of a network interface card.

17        Fig. 3 is a schematic of a networked computer with a positive disconnect device  
18 for the network in accordance with a third preferred embodiment where the disconnect  
19 device is part of the motherboard.

20        Fig. 4 is a schematic of a networked computer with a positive disconnect device  
21 for the network in accordance with a fourth preferred embodiment.

22        Fig. 5 is a schematic of a preferred embodiment of the positive disconnect device  
23 shown with relays in an open position, isolating the computer from the network.

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2        It should be understood that the appended drawings are not necessarily to scale,  
3        presenting a somewhat simplified representation of various preferred features  
4        illustrative of the basic principles of the invention. The specific design features of the  
5        positive disconnect device as disclosed here, including, for example, the specific  
6        number of relays will be determined in part by the particular intended application and  
7        use environment. Certain features of the illustrated embodiments have been enlarged  
8        or distorted relative to others to facilitate visualization and clear understanding. In  
9        particular, thin features may be thickened, for example, for clarity of illustration. All  
10        references to direction and position, unless otherwise indicated, refer to the orientation  
11        of the damper control device illustrated in the drawings.

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13 **DETAILED DESCRIPTION OF CERTAIN PREFERRED EMBODIMENTS**

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15        It will be apparent to those skilled in the art, that is, to those who have knowledge  
16        or experience in this area of technology, that many uses and design variations are  
17        possible for the positive disconnect device disclosed here. The following detailed  
18        discussion of various alternative and preferred features and embodiments will illustrate  
19        the general principles of the invention with reference to a positive disconnect device  
20        suitable for use with a computer connected to the Ethernet. Other embodiments  
21        suitable for other applications will be apparent to those skilled in the art given the benefit  
22        of this disclosure.

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1 Referring now to the drawings, Fig. 1 shows a schematic of a preferred  
2 embodiment showing computer 10, with a network interface card 13, which is software  
3 and hardware which enables the computer to communicate with a network connection  
4 to the Ethernet or other networked computers. A network connection 16 connects the  
5 computer 10 to other data generation devices, and can comprise, for example, a cable  
6 modem line or a digital subscriber line (DSL). A familiar keyboard 12 and mouse 11  
7 forms part of a user interface 17. The user interface is considered to have activity when  
8 an operator is pushing on keys on the keyboard, moving the mouse, or otherwise  
9 actively engaging the user interface so that it sends an output signal. The output signal  
10 can include information about such activity as well as instructions to be sent to other  
11 computers through the network connection 16. Other components suitable for use as  
12 part of a user interface (including, for example, touch screen monitors and game control  
13 equipment) will be readily apparent to those skilled in the art given the benefit of this  
14 disclosure.

15

16 In accordance with a highly advantageous feature, a positive disconnect device  
17 15 is provided between the network interface card 13 and the network connection 16.  
18 In Fig. 1 the positive disconnect device is shown as a “add-on” or “plug-in” device, which  
19 can be connected to a computer’s universal series bus (USB) ports 14, typically found  
20 at the back of conventional PCs and laptops. The positive disconnect device 15  
21 receives the output signal from the user interface, determines if there has been any user  
22 activity at any of the user interface devices 17 for a preselected period of time. If so,  
23 then the connection between the network interface card 13 and the network connection

1 16 remains uninterrupted. However, if the user interface is not used for the preselected  
2 period of time, then the positive disconnect device prevents communication between the  
3 card 13 and connection 16. This advantageously protects the computer 10 from viruses  
4 or other undesired data transmission over the internet or from other networked  
5 computers, etc., while the user is not using the computer.

6

7 Fig. 5 shows a preferred embodiment of the positive disconnect device 15  
8 comprising a series of electronic relays 23-30 which are shiftable from an open position  
9 to a closed position. Relays 23-30 may be, for example, normally open single pole  
10 single throw (SPST) relays. The number of relays preferably would correspond to the  
11 number of input and output signals. Current Ethernet networks carry two input signals  
12 and two output signals but are readily adaptable to go as high as eight, thus eight relays  
13 are shown. In response to a command to engage the network connection, a control  
14 voltage is applied across the relays. This keeps the relays in a position where the  
15 Ethernet connection is maintained. Then, when the output signal from the user  
16 interface indicates the preselected period of inactivity, positive disconnect device 15  
17 removes the control voltage and the relays block the electrical communication between  
18 the network card 13 and the network connection 16. Other kinds of relays suitable for  
19 use here will be readily apparent to those skilled in the art given the benefit of this  
20 disclosure.

21

22 Fig. 2 shows an alternative embodiment where the positive disconnect device  
23 115 is incorporated into the network interface card 13. Fig. 3 shows an alternative

1 embodiment where the positive disconnect device 215 is incorporated into a  
2 motherboard 18 of the computer. Thus, the positive disconnect device can be retrofitted  
3 onto existing computers (Fig. 1) or incorporated into standard components of PCs and  
4 laptops (Figs. 2 and 3). Fig. 4 shows another embodiment where the positive  
5 disconnect device 315 is instead of being incorporated into the computer is incorporated  
6 into the data transmission device, shown here as cable 16. It will be readily apparent to  
7 those skilled in the art that the computer will have a power supply to the Internet, and  
8 that the data transmission device will have an internet in line and internet out line.

9

10 In the embodiment shown in Fig. 1, screen saver software 22 is shown. Such  
11 screen saver software normally sets the screen on a monitor or other projection device  
12 to a default setting in response to user interface inactivity for a preselected period of  
13 time. In accordance with a highly advantageous feature, the preselected period of time  
14 before the screen saver software sets the screen to a default setting can be the same  
15 preselected period of time before the positive disconnect device 15 severs the  
16 connection between the network card 13 and the data transmission device 16. Of  
17 course, the screen saver software may be connected with the positive disconnect  
18 device of any of the preferred embodiments discussed or shown in the drawings.

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20 From the foregoing disclosure and detailed description of certain preferred  
21 embodiments, it will be apparent that various modifications, additions and other  
22 alternative embodiments are possible without departing from the true scope and spirit of  
23 the invention. The embodiments discussed were chosen and described to provide the

1 best illustration of the principles of the invention and its practical application to thereby  
2 enable one of ordinary skill in the art to utilize the invention in various embodiments and  
3 with various modifications as are suited to the particular use contemplated. All such  
4 modifications and variations are within the scope of the invention as determined by the  
5 appended claims when interpreted in accordance with the breadth to which they are  
6 fairly, legally, and equitably entitled.

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